Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE RELATION OF SPELLING ABILITY TO GENERAL INTELLIGENCE AND TO MEANING VOCABULARY

J. DAVID HOUSER
Oakland, California

The following study was undertaken as an attempt to discover the relation between the spelling ability, the general intelligence, and the meaning vocabularies (measured in terms of defining ability) of the members of average classes of elementary-school pupils. The school in which the tests were made was the Haight School, of Alameda, California. The pupils in this school come for the most part from homes where the parents are of moderate means, the school itself being situated in a purely residential district. The percentage of foreigners here is small, and no children were tested who speak another language than English at home.

Before any tests were given, the teachers of the classes selected for testing were asked to make a careful ranking of the pupils in their rooms according to their estimation of the relative intelligence of these children. These attempts at ranking were preceded by several discussions as to what the basis of judgment in making the rankings ought to be. It was brought out that mere success in the work of the classroom, so far as it might signify nothing more than unusual powers of memory or application, ought not to be overemphasized, but that ability successfully to meet new situations was a criterion to be taken into account.

These rankings were then made by the teachers of the high fourth, high fifth, high sixth, high seventh, and high eighth grades. In the first two rooms the work was done independently by the teachers in charge of those rooms; in the last three grades, where departmental teaching prevails, the rankings were composite ones, arrived at in conference between all the teachers of those grades.

In this connection the results of some intelligence tests made at about this time in the same school are relevant. In several of the rooms under consideration in this study the Binet tests were applied by Mr. Wilford E. Talbert, then a graduate student of the Department of Education of Leland Stanford Junior University. In all cases the teachers' rankings paralleled very closely those arrived at through the use of the Binet tests, the correlation between the two ranging from .6 to .8. This would seem to give a high degree of validity to the teachers' estimates.

After the intelligence rankings had been compiled according to the plan just explained, 179 words were selected for testing purposes. These words were chosen from an abridged dictionary, each hundredth word being taken. No homonyms were included in the list, however.

The following were the words chosen in this way:

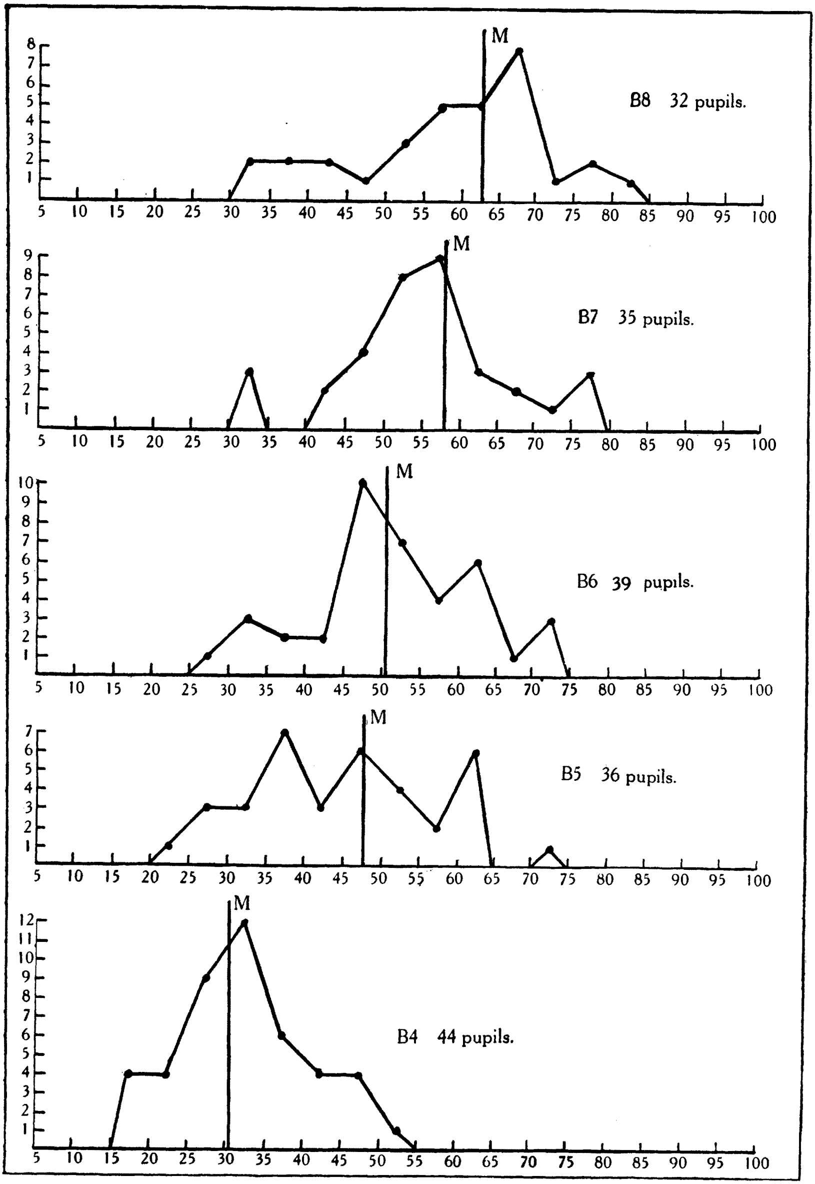
abroad
acquire
adventurous
agreeable
aloof
ancient
ape
archaism
askew
attest
barb
beautiful
bereave
bite
bogus
brain
bruited
butcher
career
caterer
chafe
cheroot
church
clematis
cockspur
comb
compilation
condescend
consanguinity
continual
cordial
countless
cubit
cyclopedia
debauchee
deficiency
dental
destitute
difficulty
discipline
displease
dizzy
dragoon
duel
echo
elegy
emperor
enormous
equilibrium
evade
exhale
extirpate
fan
feign
Filipino
flatulence
foggy
fork
freely
fumigate
gamin
genuine
gloat
Goths
greyhound
gullible
handicap
hated
heinous
hierarchy
homespun
housing
hypercritical
immaculate
importune
incertitude
indicate
infernal
inlay
institution
interval
irreclaimable
jeremiad
jury
lank
lea
Lenten
lightsome
liturgy
lorgnette
lying
malapropos
mantelet
masterpiece
medicate
mesmerize
miller
misfit
moisten
Mormon
mull
myth
necessary
niece
northern
oasis
octoroon
opaque
oriole
outrider
overwork
pallid

pasturage
pet
penthouse
perpetual
Pharisee
piecemeal
pithiness
pledget
polemical
porous
pound
preferment
prevention
prodigality
prophecy
prunella
purchase
quandary
quotient
rapacity
reasonably
recusant
region
remove
requisite
routine
rickets
rocket
sable
sanctuary
scoundrel
seclusion
sense
shellbark
shroud
sing
slapjacks
smoulder
southerly
spume
staple
stick
strap
subdivide
surf
swoon
tamis
temperature
therewith
tight
toque
transom
triturate
turnkey
unbind
undertake
university
unsubstantial
solecism
vaccine
verbena
virile
waistcoat
weave
whiten
wombat
yell

Mimeographed sheets were then given out in each class upon which the words were to be spelled. But twenty-five words were given for spelling at a time. Each word was pronounced distinctly as many times as was necessary, but the words were not used in illustrative sentences, nor was any other indication given as to their meaning. Since no homonyms occurred, there was no necessity for teachers to explain any distinctions which might otherwise have been necessary.

After the words had all been spelled the papers were collected from each room, and nothing more was said of the test. The vocabulary or defining test was not given until after a period sufficiently long for memory of the words to have passed from the pupils' minds. No mention of the fact that this latter test was to be given upon the same words was made to the pupils until they were actually ready to take it.

After more than a month had elapsed, therefore, mimeographed sheets were given to the pupils with the same words upon them as the ones they had previously spelled. They were told to write as exactly as possible the meaning of each word. The manner in which this was to be done was not prescribed, and the children were at liberty to define by means of synonyms or by the use of



GRAPH 1.—Spelling tests

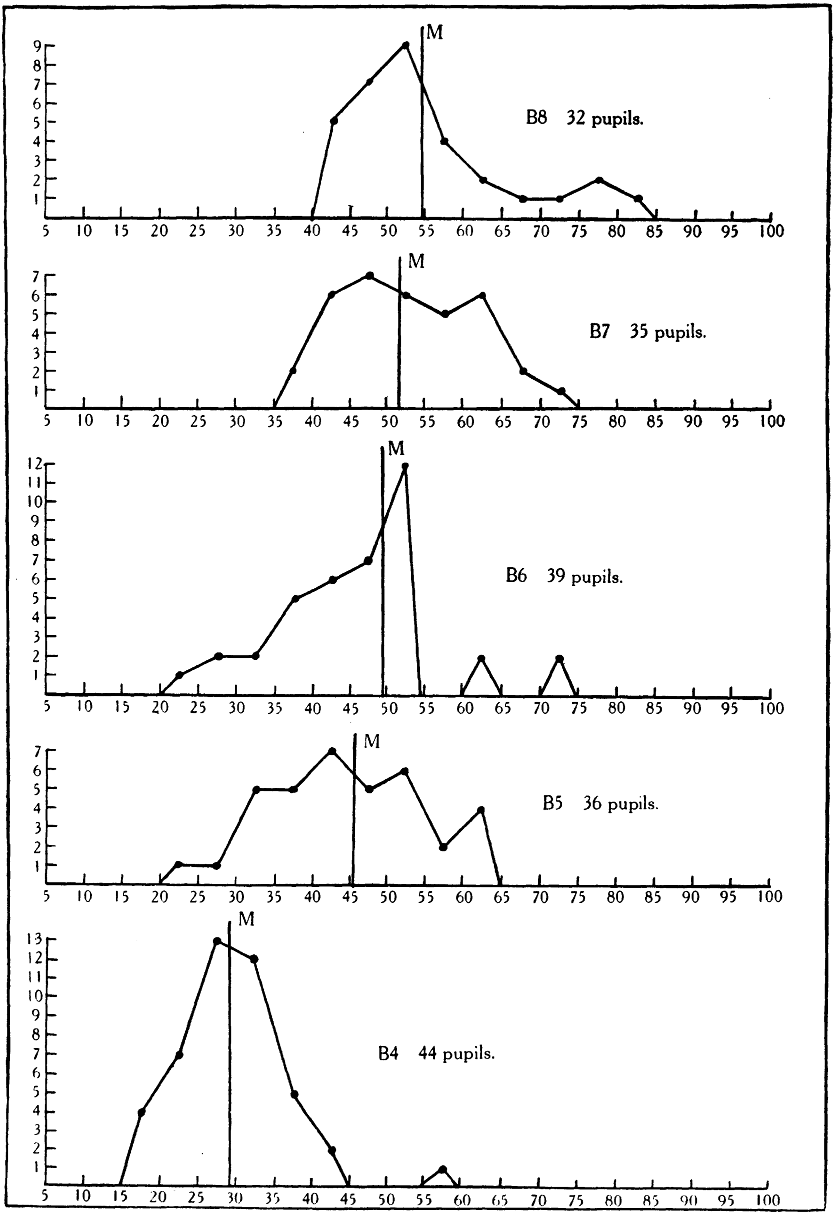
the words in phrases or sentences. All three methods were, as a matter of fact, actually used.

In the correction of the latter papers half credit was occasionally given where it seemed evident that the child's idea of the word, though somewhat vague, was approximately correct.

The following graphs show the relative accomplishments of the pupils in the five grades in the spelling and vocabulary tests. Since the same list of 179 words was given for both spelling and defining in each of the grades tested, the base upon which each curve is drawn is the same, and relative accomplishment can thus be seen. The base represents percentages, and the height of the curves the number of children attaining the various percentages in the two tests. On account of the comparatively small number tested, however, the percentages are grouped by fives, and the elevation of the curve at each point represents specifically the number of pupils attaining, for instance, percentages between 30 and 35, 55 and 60, and so on. M, of course, represents the median in each case, M-S being the median of spelling and M-D that of defining in the combined curves.

Graph 1.—In this first graph, representing the results of the spelling tests in the five grades, the great difference between the accomplishments of the children in the two lower grades will at once be marked. No such wide difference exists between the results of the pupils' efforts in the four upper grades. In other words, the rate of improvement is much lower between the fifth, sixth, seventh, and eighth grades than between the fourth and fifth. Whereas the gap between the medians in the two lower grades represents a difference of nearly 20 per cent, the difference between the medians of the sixth and seventh grades, where the next widest gap exists, represents less than 10 per cent. The difference between the medians of the fifth and eighth grades is only about 15 per cent, or 5 per cent less than that between the fourth and fifth grades.

The difference between the best accomplishment in each class and the poorest represents a range of 50 per cent in the eighth grade, 45 in the seventh and sixth, and 50 in the fifth. In the



Graph 2.—Defining tests

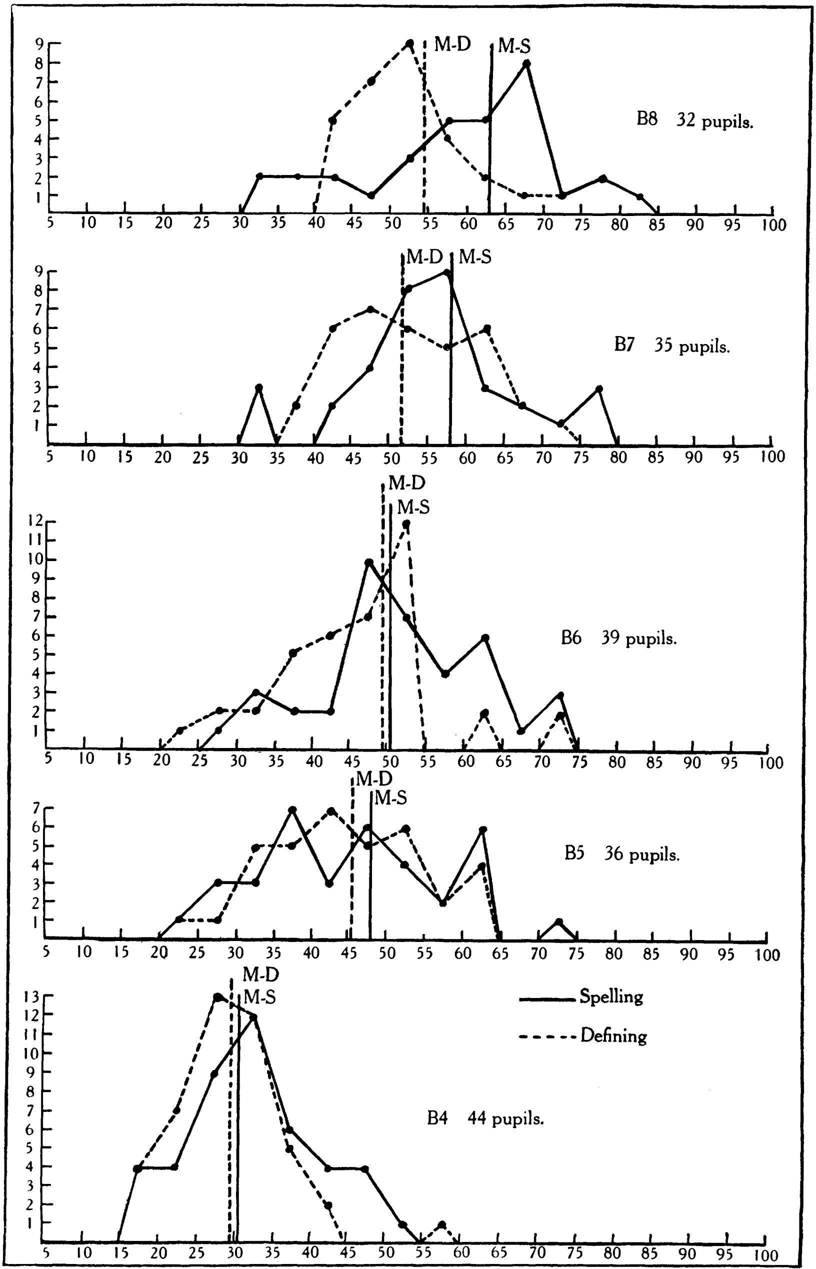
fourth grade the variation is not so great, the difference being only 35 per cent. The poorest accomplishment in the eighth grade is at about the same point as the median of the fourth grade; the best in the latter grade is but 10 per cent lower than the median point of the eighth grade.

Graph 2.—The relationships between the accomplishments of the children in the five grades in the defining or vocabulary tests are very similar to those in the spelling tests. The same marked difference between the two lower grades and the much smaller amount of improvement progressively between the four upper grades will be noted at once. There is a difference between the medians of the two lower grades of 15 per cent as contrasted with one of 20 per cent between the medians of spelling in the same grades. The medians of the four upper grades are very close together, and there is a difference of less than 10 per cent between that of the fifth and that of the eighth.

The variation between the best accomplishments and the poorest is somewhat less in these tests than with the spelling tests. It is only 25 per cent in the fourth grade if the isolated case, representing an exceptional child, be not taken into account.

Graph 3.—In the third graph, representing a combination of the two curves in each case, a comparatively high degree of correspondence between the class accomplishments in spelling and defining will be noticed, with the possible exception of the eighth grade. The two medians are separated by less than 10 per cent in all cases, and in the three lower grades by less than 3 per cent.

It deserves to be stated here that the fourth grade under consideration was not regarded in any way as a backward class, nor was there any number of children in it of other than average or more than average ability. Ranked informally with other classes in the school it would have been classified as perfectly normal. In view of this and of the results recorded in these tests, a certain reflection might seem to rest upon that type of ability represented in spelling and defining accomplishment as a standard of grading. A more comprehensive series of tests of this sort in which varying elements were taken into closer account might reveal different results, however.



GRAPH 3.—Combined spelling and defining tests

Table I shows the average number of words correctly spelled and the average number correctly defined out of the total of 179 given for each test in the five grades, together with the mean variation for spelling and defining:

TABLE I

Grade	Average Number Correctly Spelled	Mean Variation in Spelling	Average Number Correctly Defined	Mean Variation in Defining
B4..........	57.93	13.25	52.23	10.08
B5..........	83.22	18.81	80.84	12.63
B6..........	93.54	15.84	85.94	14.21
B7..........	103.26	16.03	94.29	13.52
B8..........	106.03	18.42	97.00	12.75

The use of the Pearson formula for the coefficient of correlation shows the following relationships:

	B4	B5	B6	B7	B8
Spelling and intelligence......	0.71	0.596	0.346	0.492	0.508
Spelling and meaning vocabularies....................	0.64	0.61	0.81	0.45	0.61
Intelligence and meaning vocabularies................	0.41	0.47	0.391	0.226	0.47

The averages of these various coefficients of correlation are the following: (1) between spelling ability and general intelligence, 0.5304; (2) between spelling ability and meaning vocabularies, 0.624; (3) between meaning vocabularies and general intelligence, 0.3934.

Table II shows the ranking in the spelling and defining tests of the five pupils judged by the teachers to be the most intelligent and those of the five judged the least intelligent in each class:

The correlations in all cases, with the possible exceptions of those between spelling and intelligence in the sixth grade and between intelligence and meaning vocabularies in the seventh, would seem to be high enough to deserve being called significant. That, however, these relationships within each grade and in the average should indicate in all but one instance a considerably higher correlation between spelling ability and intelligence than between meaning vocabularies (or defining ability) and intelligence is little short of surprising.

TABLE II

B4			*B5*			*B6*			*B7*			*B8*		
Intelligence	Spelling	Defining	Intelligence	Spelling	Defining	Intelligence	Spelling	Defining	Intelligence	Spelling	Defining	Intelligence	Spelling	Defining
1	1	1	1	1	1	1	10	15½	1	3	4	1½	1	4
2	9	3	2	5	10	2	3	3	2	7½	1	1½	3	2
3	12½	11	3	2½	6	3	2	2	3	25	3	3	22	13
4	27	37	4	16½	3½	4	1	1	4	2	2	4	11½	23½
5	3	2	5	7	14	5	24½	30	5	14½	13	5	4	3
40	40	40	32	18½	34	35	28½	24	31	35½	33	28	11½	16½
41	30½	29½	33	14½	36	36	13	11	32	23	13	29	29	20
42	15	18	34	34½	29	37	16	15½	33	11	11	30	22	23½
43	30½	36	35	11½	19½	38	34	33	34	24	12	31	32	32
44	44	26	36	34½	30½	39	20	22	35	29	23½	32	21	13½

The data are probably not extensive enough to justify speculation as to the cause of this correspondingly low correlation. The method used in making the intelligence rankings might be considered inadequate, but in this connection it is worth mentioning again that the estimates of these teachers paralleled very closely results of the use of the Binet tests. It is true, of course, that finer distinctions would be necessary in ranking pupils in any given grade than in ranking a similar number of pupils of the same chronological age.

What differences would have resulted in the defining tests had the words been offered for interpretation within a context is problematical. That the test was a fair one of ability to *use* the words would seem evident, however.